

QUALITY ASSURANCE SAMPLING PLAN
FOR
SITE REASSESSMENT
DELTA SHIPYARD
INDUSTRIAL BOULEVARD
HOUMA, TERREBONNE PARISH, LOUISIANA

Prepared for

U.S. Environmental Protection Agency Region 6

Linda Carter, Project Officer
1445 Ross Avenue
Dallas, Texas 75202

Contract No. EP-W-06-042

Technical Direction Document No. TO-0019-11-10-01

WESTON Work Order No. 20406.012.019.0680.01

NRC No. N/A

CERCLIS No. LAD058475419

FPN No. N/A

EPA SAM: Brenda Nixon Cook

START-3 PTL: Michelle Brown

Prepared by

Weston Solutions, Inc.

Robert Beck, VP, P.E., Program Manager
70 NE Loop 410, Suite 600
San Antonio, TX 78216
(210) 308-4300

May 2012

SIGNATURE PAGE

Brenda Nixon Cook
U.S. Environmental Protection Agency Region 6
Site Assessment Manager

Date

Gary Moore
U.S. Environmental Protection Agency Region 6
On Scene Coordinator

Date

Jeff Criner
Weston Solutions, Inc.
START-3 Assessment/Inspection Manager

Date

Cecilia Shappee, P.E.
Weston Solutions, Inc.
START-3 Quality Assurance Officer

Date

Michelle Brown
Weston Solutions, Inc.
START-3 Site Assessment Project Team Leader

Date

Jeff Wright
Weston Solutions, Inc.
START-3 Removal Assessment Project Team Leader

Date

TABLE OF CONTENTS

Section	Page
1. INTRODUCTION	1-1
1.1 PROJECT OBJECTIVES	1-1
1.2 PROJECT TEAM	1-3
1.3 QASP FORMAT.....	1-3
2. SITE BACKGROUND.....	2-1
2.1 SITE LOCATION AND DESCRIPTION	2-1
2.2 SITE HISTORY	2-2
2.3 PREVIOUS INVESTIGATIONS	2-3
2.4 SITE CONCERNS.....	2-4
3. SAMPLING APPROACH AND PROCEDURES.....	3-4
3.1 OVERVIEW OF SAMPLING ACTIVITIES.....	3-4
3.1.1 Site Assessment	3-5
3.1.2 Removal Assessment	3-5
3.1.3 Data Quality Objectives.....	3-5
3.1.4 Health and Safety Plan Implementation	3-6
3.1.5 Community Relations	3-7
3.2 SAMPLING/MONITORING APPROACH.....	3-7
3.2.1 Waste Characterization Sampling.....	3-7
3.2.2 Surface Water Pathway Sampling	3-8
3.2.3 Soil Sampling.....	3-9
3.2.4 Investigation-Derived Wastes.....	3-9
3.2.5 Sample Handling Procedures.....	3-10
3.2.6 Quality Assurance/Quality Control Samples	3-10
3.3 SAMPLE MANAGEMENT	3-11
3.4 DECONTAMINATION	3-12
3.5 SAMPLE PRESERVATION, CONTAINERS, AND HOLD TIMES.....	3-12
4. ANALYTICAL METHODS.....	4-18
5. DATA VALIDATION.....	5-1
6. QUALITY ASSURANCE.....	6-1
6.1 SAMPLE CUSTODY PROCEDURES	6-1
6.2 PROJECT DOCUMENTATION.....	6-2
6.2.1 Field Documentation.....	6-2
6.2.2 Report Preparation	6-6

LIST OF APPENDICES

- Appendix A EPA Contract Laboratory Program Guidance for Field Samplers
- Appendix B Site-Specific Data Quality Objectives
- Appendix C WESTON and ERT Standard Operating Procedures
- Appendix D Laboratory Analyte List and Reporting Limits
- Appendix E START-3 TDD No. TO-0019-11-10-01 and Amendments

LIST OF FIGURES

Title

Figure 1-1	Site Location Map
Figure 2-1	Site Area Map
Figure 3-1	Site Assessment and Removal Assessment Proposed Sample Location Map - Waste Characterization and Soil
Figure 3-2	Site Assessment Proposed Sample Location Map – Sediment & Surface Water

LIST OF TABLES

Title

Table 3-1	Site Assessment Sample Locations and Sampling Rationale.....	3-11
Table 3-2	Removal Assessment Sample Locations and Sampling Rationale.....	3-13
Table 4-1	Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times	4-20
Table 4-2	Field and Laboratory QA/QC and Analysis Summary	4-21

1. INTRODUCTION

Weston Solutions, Inc. (WESTON®), the EPA Region 6 Superfund Technical Assessment and Response Team (START-3) contractor, has been tasked by the U.S. Environmental Protection Agency (EPA) Region 6 Prevention and Response Branch (PRB) under Contract No. EP-W-06-042 and Technical Direction Document (TDD) No. TO-0019-11-10-1 (Appendix E) to perform Site Reassessment (SR) activities at the Delta Shipyard site located off Industrial Boulevard, at 200 Dean Court in Houma, Terrebonne Parish, Louisiana. A Site Location Map is provided as Figure 1-1. The Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database number assigned to the Delta Shipyard Site is LAD058475419. START-3 has prepared this Quality Assurance Sampling Plan (QASP) to describe the technical scope of work (SOW) to be completed as part of the SR.

1.1 PROJECT OBJECTIVES

START-3 is providing technical assistance to EPA Region 6 for the performance of the SR to collect the data necessary to support EPA's determination that the site presents a threat to public health or welfare of the United States or the environment in accordance with *40 Code of Federal Regulations (CFR) 300.415*.

The primary objectives of this reassessment are the following:

- To identify potential threats that hazardous substances attributable to the site may pose to human health and the environment. The existence and migration of hazardous substances will be determined by identifying the receptors, or targets, potentially exposed to the hazardous substances.
- To determine the nature and extent of site-related contamination in known or suspected on-site waste sources. This information will be used in the event that emergency removal activities are required.

The SR objectives will be achieved by collecting and analyzing:

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF THE EPA.

- Waste source samples
- Surface water and sediment samples from background, on-site and downgradient locations; and
- surface and subsurface soil samples from on-site locations.

The samples will be collected to delineate the extent of contamination both horizontally and vertically to a depth of approximately 8 feet below ground surface (bgs) or until refusal. Surface and subsurface soil sampling will be collected along the outer perimeter of the containment berms to determine if source contamination has migrated from the impoundment area. The collected samples will be analyzed for site-specific Contaminants of Concern (CoCs), identified in previous investigations, including polycyclic aromatic hydrocarbons (PAHs), barium and arsenic. The PAHs of concern include benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, phenanthrene, and pyrene.

The data and information collected by START-3 during the SR will be used for two purposes. First, is to evaluate the site using the Hazard Ranking System (HRS) and to assist in determining whether the site is a potential candidate for inclusion on the National Priorities List (NPL). The intent of the SR is to provide documentation necessary to either rank the site on the NPL or assign a “No Further Remedial Action Planned” (NFRAP) status. The site-specific screening levels for the HRS data package will be three times the maximum background sample concentrations.

Secondly, in the event that a NFRAP status is assigned to the site, the information collected by START-3 during the SR will be used to characterize and determine the estimated volume of material that may require removal during an emergency removal action. Soil sample results will be compared to EPA Region 6 Industrial Soil Screening Levels (Appendix ??). Waste sample results will be used to characterize the source material, estimate volumes, and determine the appropriate disposal method if an emergency removal action is required.

1.2 PROJECT TEAM

The Project Team will consist of START-3 personnel including David Bordelon as the Scope of Work Leader, Michelle Brown as the START-3 Site Assessment Project Team Leader (PTL), Jeffrey Wright as START-3 Removal Assessment PTL, a Field Safety Officer (FSO), a Data Manager, and additional START-3 Field Team Members to assist with sampling activities. The PTLs will be responsible for the technical quality of work performed in the field and will serve as the START-3 liaisons to EPA Region 6 Task Monitors during the site activities. The PTLs, with the concurrence of EPA, will determine the precise location for sample collection in the field, collect samples as necessary, log the activities at each sample location in the field logbook, and verify the sample documentation. The Data Manager will be responsible for entering all samples collected into SCRIBE; producing accurate chain-of-custody documentation for the samples during the assessment; and entering daily operations and sample collection data into the Regional Response Center–Enterprise Data Management System (RRC-EDMS) Response Manager software. The PTLs will oversee the packaging and shipping of samples to either an EPA-designated Contract Laboratory Program (CLP) laboratory, EPA Region 6 Environmental Services Branch (ESB) Laboratory located in Houston, Texas, or a contracted private laboratory. The START-3 FSO will also be responsible for providing overall site health and safety support during the removal assessment field activities.

1.3 QASP FORMAT

This QASP has been organized in a format that is intended to facilitate and effectively meet the objective of the removal assessment. The QASP is organized as follows:

- Section 1 – Introduction
- Section 2 – Site Background
- Section 3 – Sampling Approach and Procedures
- Section 4 – Analytical Methods
- Section 5 – Data Validation
- Section 6 – Quality Assurance

Tables are included at the end of each representative section. All figures are provided as separate Portable Document Format (PDF) files. Appendices are attached with the following information:

- Appendix A EPA Contract Laboratory Program Guidance for Field Samplers
- Appendix B Site-Specific Data Quality Objectives
- Appendix C WESTON and ERT Standard Operating Procedures
- Appendix D Laboratory Analyte List and Reporting Limits
- Appendix E START-3 TDD No. TO-0019-11-10-1 and Amendments

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF THE EPA.

2. SITE BACKGROUND

Information regarding the site location, description, and site history are included in the following subsections.

2.1 SITE LOCATION AND DESCRIPTION

The former Delta Shipyard site (Site) is located at 200 Dean Court in southeastern Houma, Terrebonne Parish, Louisiana. The geographic coordinates of the site are Latitude 29.565818° north, Longitude 90.705141° west. The Site can be reached by traveling south on U.S. Highway 90 from New Orleans to Houma. Turn east on Main Street, and travel approximately 0.75 miles to Grand Caillou Road. On Grand Caillou Road, travel approximately 2.2 miles to Industrial Boulevard. On Industrial Boulevard turn west and, after approximately 1.5 miles, turn south on Dean Court. A Site Area Map is included as Figure 2-1.

The site is located on property owned by Elevated Boats, Inc. (EBI). The area of concern consists of three evaporation pits located approximately 800 feet south of the EBI fabrication building and east of Dean Court Road. The outer perimeter of Pits 1 through 3 measures approximately 850 ft. by 150 ft. Historical records indicated that a fourth pit was present on site and located approximately 250 ft west of Pit 3. Pit 4 is currently filled-in with dirt and overgrown with grass. The outer perimeter of Pit 4 measured approximately 465 ft. by 360 ft. The Delta Shipyard site is located within an industrial area in Houma, LA. The site is not fenced, nor is there any site security to limit public access to the site. The site is bordered to the north by EBI, to the east by Company Canal waterway, to the south by an industrial crane company (F&M Marco, Inc., and to the west by Bayou LaCarpe. The majority of the land surrounding Pits 1 through 3 is covered by overgrown vegetation, shrubs, and trees. The area associated with Pit 4 is an open field overgrown with grass. There are no surface drainage containment or diversion structures that would prohibit the migration of on-site contamination in the surface soil from migrating off-site.

The topography at the site slopes to the southeast toward the Company Canal waterway. Surface water sheet flows off-site within drainage ditches along Dean Court and then proceed east along the southern border of the property into Company Canal waterway.

There are no known registered monitoring wells located within the area.

For the purposes of this QASP, the Site will be defined as outlined in the HRS (Section 1.1, Definitions), as “[a]rea(s) where a hazardous substance has been deposited, stored, disposed, or placed, or has otherwise come to be located”. The Site consists of the three pits (Pits 1 through 3, also called impoundments) and the area surrounding them. This Site area is approximately 4.8 acres.

2.2 SITE HISTORY

The former Delta Shipyard was owned by Delta Ironworks, Inc. Delta Ironworks, Inc. was formed by the merging of the following companies in 1972:

- Delta Mud & Chemical Company Inc.,
- Gem Oil Tool Co. Inc.,
- Intercoastal Drilling Inc.,
- Delta Safety & Supply Co. Inc.,
- Petroleum Treaters Inc., and
- Arnold & Clark Chemical Company, Inc.

The entire property consisted of 165 acres and was home to seven divisions of Delta Ironworks, including Delta Shipyard. In 1973, Delta Ironworks was merged into Chromalloy American Corporation of St. Louis, Missouri. Chromalloy maintained all seven of the divisions until November 1980, when five of the divisions were sold to Delta Services Industries of Houma, Louisiana including Delta Shipyard. Mr. Lynn Dean (of Dean Boats, Inc.) purchased 110 acres of the industrial park from Delta Services in 1986 including the property owned by Delta Shipyard.

Delta Shipyard consisted of a cleaning and repair facility for small cargo boats, fishing boats,

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

and oil barges. Before repair work could begin, the boats had to be certified vapor free by the U.S. Coast Guard. In order to accomplish this, the boats were first steam cleaned to remove oily wastes. Recovered oil that was still deemed usable was recovered and sold. Oily waste from the cleaning process was stored in several unlined earthen pits used as evaporation ponds. These pits were reportedly also used to dispose of oil field drilling material.

Currently, there are three evaporation pits located on-site. During a site reconnaissance conducted 10 January 2012, the three pits were observed to be uncovered and their contents exposed to the elements. The pits have no vegetation growing on them and have a crusty layer on the surface. The crusty layer on the pits is black and appears to be a dried oil/petroleum type waste. The earthen berms are not maintained, contain heavy vegetation and do not appear to have sufficient head space to contain the contents of the pits in a rain event. A second site reconnaissance was conducted on 7 June 2012, the area around the pits was observed to be overgrown with vegetation. The three pits were exposed to the elements as stated above; however some grass and other native vegetation were observed growing within the pits. Based on a review of historical documents, there was a fourth pit located west of Dean Court; as previously stated the area associated with Pit 4 is currently an open field overgrown with grass. No evidence of the additional fourth pit was observed during the two site reconnaissance.

2.3 PREVIOUS INVESTIGATIONS

In 1985, Wink Engineering collected sludge samples from the on-site pits for LDEQ. . The samples were analyzed for volatile organics, cyanide, total phenol, flash point, pH, toxicity and oil & grease. Based on the analytical results, the 1985 Wink report concluded that the site did not pose a threat to human health or the environment.

In December 1994, WESTON completed a Site Inspection Prioritization (SIP) for EPA Region 6 under the Alternative Remedial Contracting (ARCS). Three pit sludge and four drainage ditch sediment samples were collected. The analytical results revealed the presence of elevated concentrations of several PAH semivolatile organic compounds and metals. In December 1996, WESTON completed an Expanded Site Inspection Report under the ARCS contract. Over 60

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

samples were collected to document the presence and evaluate the extent of migration of hazardous substances associated with Delta Shipyard site. The analytical results showed elevated levels of VOCs, PAHS and metals in the on-site pits, and evidence of off-site migration.

2.4 SITE CONCERNS

The primary concerns at the Delta Shipyard site is the presence of metals and SVOCs including benzo(a)pyrene. The contamination appears to be the result of past industrial practices associated with the Delta Shipyard cleaning and repair activities. Chemical analysis of surface soils collected from the site indicates the presence of 2-methylnaphthalene, naphthalene, phenanthrene, total xylenes, chromium, arsenic and barium in concentrations exceeding three times background. The site is situated in an industrial area of Houma, LA. The owner of EBI lives on site. The site is not fenced nor is there any security; thus, the site and contaminated waste and soil at the site are accessible to the general public.

3. SAMPLING APPROACH AND PROCEDURES

The specific field investigation activities that will be conducted during site sampling are presented in the following subsections. Sampling activities will be conducted in support of two separate mission requirements: 1) Site Assessment documentation; and 2) Removal Assessment documentation. The sampling approach for each mission is different and therefore will be addressed separately in the following subsections. Samples collected as part of this SR will be obtained in accordance with EPA *Contract Laboratory Program Guidance for Field Samplers*, EPA540-R-00-003, OSWER 9240.0-35 (Appendix A). START-3 will use EPA Scribe Environmental Sampling Data Management System (SCRIBE) software to manage sample data.

3.1 OVERVIEW OF SAMPLING ACTIVITIES

EPA and START-3 developed sampling strategies intended to collect data necessary to evaluate and meet the objective of both the Site Assessment and the Removal Assessment. Data quality

objectives as well as an overview of the health and safety and field activities required to complete these tasks are presented in the following subsections.

3.1.1 Site Assessment

In support of the Site Assessment, this SR is being performed to evaluate the surface water exposure pathway at or near the Delta Shipyard site. The EPA SAM and START-3 will collect 16 surface water samples and/or sediment samples from Company Canal, Bayou La Carpe, and the Houma Navigation Canal (including seven background and one Quality Assurance/Quality Control [QA/QC]). START-3 will also collect 3 waste samples from the visible pits (one from each pit) and 2 soil samples from where historical pits were located on the west side of the property. In addition, 11 soil/sediment (including 1 duplicate) samples will be collected from the overland flow pathway between the source and the probable point of entry into the surface water pathway.

3.1.2 Removal Assessment

In support of the Removal Assessment, this SR is being performed to characterize the waste material within the on-site pits and to determine the horizontal and vertical extent of on-site contamination. The EPA OSC and START-3 will collect source characterization core samples from each of the three on-site pits. Core samples will be collected from five points within each pit. Up to five samples per core, selected by START-3 FTL, based on visual observation will be collected for analytical testing. In addition, surface and subsurface soil samples will be collected from 12 locations outside the perimeter of the impoundment berms to assess the vertical and horizontal extent of contamination. Up to four samples per location, selected by START-3 FTL, based on visual observation will be collected for analytical testing.

3.1.3 Data Quality Objectives

The objectives of the Site Assessment sampling activities described in this QASP are to reassess known or suspected hazardous waste source areas and obtain updated analytical data documenting a release of site-related hazardous substances and contaminants into the surface

water pathway. To accomplish this, the following data quality objectives (DQOs) have been established and are included in Appendix B:

- Characterize the source(s) and areas of observed contamination.
- Reassess if there is a release of site-related contamination in the surface water pathway.

The DQOs were developed using the seven-step process set out in the *EPA Guidance for Quality Assurance Project Plans: EPA QA/G-5*. Table 3-1 summarizes the Site Assessment sample locations and the rationale for their collection.

The objectives of the Removal Assessment sampling activities described in this QASP are to characterize the suspected hazardous waste source areas and obtain analytical data documenting the horizontal and vertical extent of contamination. To accomplish this, the following data quality objectives (DQOs) have been established and are also included in Appendix B:

- Characterize the waste material located within the on-site pits.
- Assess the vertical and horizontal extent of contamination associated with the on-site pits.

The DQOs were developed using the seven-step process set out in the *EPA Guidance for Quality Assurance Project Plans: EPA QA/G-5*.

3.1.4 Health and Safety Plan Implementation

The START-3 field activities will be conducted in accordance with the site-specific health and safety plan (HASP). The FSO will be responsible for implementation of the HASP during all field investigation activities. The HASP specifies that soil, sediment and waste sampling will proceed in modified Level D (coveralls, safety glasses, disposable gloves, and steel-toed boots). The PTL will act as the Field Safety Officer (FSO) and will be responsible for implementation of the HASP during all field investigation activities. The START-3 field team will be required to conduct work according to the guidelines and requirements of the HASP. In accordance with the WESTON general health and safety operating procedures, the field team will also drive the route to the hospital specified in the HASP prior to initiating sampling activities.

3.1.5 Community Relations

Community relations may require additional EPA involvement due to the general nature of the site. Community relations issues will be directed to the EPA OSC. If the EPA OSC is not present, the START-3 PTLs, under the guidance of the START-3 Scope of Work Leader will manage community relations in the field as directed by the OSC. If a community relations plan and implementation program becomes necessary, START-3 will establish each if requested by the EPA OSC. START-3 will work as directed by the EPA OSC to obtain access to designated sampling locations.

3.2 SAMPLING/MONITORING APPROACH

Water, Soil, sediment and source samples will be collected in general accordance with the EPA *Compendium of Emergency Response Team (ERT) Soil Sampling Surface Geophysics Procedures* and the WESTON Standard Operating Procedures (SOPs) included in Appendix C. WESTON Standard Operating Procedures (SOPs) include SOP No. 1002-01 for Surface Water Sample Collection and SOP No. 1002-04 for Sediment Sampling (Appendix C). Source samples will be collected using 1001-01, 1001-04, and 1001-10 (Surface Soil Sampling, Stockpile Sampling and Composite Sampling). The specific sampling procedures are described below.

3.2.1 Waste Characterization Sampling

In support of both the Site and Removal Assessment activities, five core samples will be collected from each of the open pits (Pits 1, 2, and 3). The exact locations of the samples will be decided by the EPA SAM/OSC and START-3 PTL. START-3 will utilize a hydraulic manlift to collect pit core samples for laboratory analysis. Core samples will be collected until a depth of refusal or groundwater is encountered. Up to five samples per core, selected by START-3 FTL, based on visual observation will be collected for analytical testing. The pit cores will be advanced to an estimated depth of 8 feet below ground surface (BGS) using poly-vinyl chloride piping with a core catcher insert. The exact locations of the samples within each pit will be decided in the field by the EPA OSC and START-3 PTL. Composite core samples will be

collected at depths of 0 to 12 inches, 1 to 2 feet, 2 to 4 feet, 4 to 6 feet and 6 to 8 feet if conditions allow.

The proposed Site and Removal Assessment source waste sample and soil sample locations are presented in Figure 3-1. Deviations from the sample locations will be due to new observations made prior to sampling, information obtained in the field that warrants an altered sampling point, difficulty in sample collection, or limited access. The EPA OSC will be notified, and concurrence will be obtained should significant deviations from the planned sampling points be proposed. Details regarding deviations of the QASP will be documented in the site logbook. Table 3-1 summarizes the Site Assessment sample locations and the rational for their collection. Table 3-2 summarizes the Removal Assessment sample locations and the rational for their collection.

The waste samples will be submitted to a NELAP certified laboratory for analyses as outlined in Section 4.0.

A five gallon waste sample will also be collected from each of the three pits for treatability analysis. These samples will not be submitted for analysis until the initial analytical data is review. Once the data is reviewed, the EPA OSC with technical assistance from START-3 will determine the parameters of the treatability analyses.

3.2.2 Surface Water Pathway Sampling

This sampling activity is in support of Site Assessment documentation only. START-3 will collect 16 co-located surface water, and sediment samples (including seven background and one duplicate sample) as part of the SR to document a release to the surface water pathway from the site. The surface water samples will be collected by submerging the sample container into the water and facing the mouth of the container upstream while sampling personnel stand downstream. The sediment samples will be collected concurrently with the surface water samples and will be grab samples at 0 to 2 inches below ground surface utilizing disposable plastic scoops. The proposed surface water and sediment sample locations are presented in Figure 3-2. Surface water and sediment samples will be submitted to a NELAP certified laboratory as outlined in Section 4.0.

3.2.3 Soil Sampling

In support of both the Site and Removal Assessment activities, START-3 will collect up to 75 surface/subsurface soil samples (including three duplicate samples) as part of the SR to assess the surface water pathway and document the vertical and horizontal extent of contamination. The proposed soil sample locations are presented in Figure 3-1.

START-3 will collect 12 (including one duplicate) of these samples from the overland flow pathway or drainage ditches from the sources to the surface water. These samples will be grab samples collected from the surface using disposable plastic scoops.

For the remaining samples, START-3 will utilize a Geoprobe[®] subsurface coring device to collect subsurface grab soil samples along the outer edge of the earthen pit containment berms. Geoprobe[®] samples will be collected until a depth of refusal or groundwater is encountered. Up to five samples per location, selected by START-3 PTL, based on visual observation will be collected for analytical testing. The Geoprobe[®] cores will be advanced to an estimated depth of 8 feet BGS. The exact locations of the extent of contamination samples will be decided in the field by the EPA OSC and START-3 FTL. It is estimated that extent of contamination soil samples will be collected at depths of 0 to 12 inches, 1 to 2 feet, 2 to 4 feet, 4 to 6 feet and 6 to 8 feet if conditions allow. .

Deviations from the sample locations will be due to new observations made prior to sampling, information obtained in the field that warrants an altered sampling point, difficulty in sample collection, or limited access. The EPA OSC will be notified, and concurrence will be obtained should significant deviations from the planned sampling points be proposed. Details regarding deviations of the QASP will be documented in the site logbook. Soil samples will be submitted to a NELAP certified laboratory as outlined in Section 4.0. TCLP analyses will not be conducted on extent of contamination soil samples.

3.2.4 Investigation-Derived Wastes

Attempts will be made to eliminate or minimize generation of IDW during this investigation. Excess soil from sample locations will be placed back in the sample holes. All non-dedicated

equipment will be decontaminated according to WESTON SOP 1201.01. Non-dedicated equipment will be rinsed with soap and water and excess fluids generated as a result of equipment decontamination will be stored on-site or will be disposed of upon completion of the removal assessment. The analytical data from collected samples will be reviewed after completion of the field activities, and disposal options will be evaluated accordingly. It is anticipated that minimal amounts of IDW will be generated during this activity.

3.2.5 Sample Handling Procedures

Samples will be collected using equipment and procedures appropriate to the matrix, parameters, and sampling objectives. The volume of the sample collected must be sufficient to perform the laboratory analysis requested. Samples must be stored in the proper types of containers and preserved in a manner appropriate to the analysis to be performed. A sample collection and analyses summary table is presented in Section 4.

All clean, decontaminated sampling equipment and sample containers will be maintained in a clean, segregated area. All samples will be collected with clean decontaminated equipment following WESTON SOP 1201.01. All samples collected for laboratory analysis will be placed directly into pre-cleaned, unused glass or plastic containers. Sampling personnel will change gloves between each sample collection/handling. All samples will be assembled and catalogued prior to shipping to the designated laboratory (following WESTON SOP 1101.1 and 1102.01).

3.2.6 Quality Assurance/Quality Control Samples

START-3 will collect field duplicates and Matrix Spike/Matrix Spike Duplicate (MS/MSD) samples of surface water, soil and sediment samples, as well as prepare equipment rinsate blank samples as needed during the assessment sampling activities. QA/QC samples will be collected according to the following dictates:

- Blind field duplicate samples will be collected during sampling activities at locations selected by the START-3 PTL. The data obtained from these samples will be used to assist in the quality assurance of the sampling procedures and laboratory analytical data by allowing an evaluation of reproducibility of results. Efforts will be made to collect duplicate samples in locations where there is visual evidence of contamination or where

contamination is suspected. Blind field duplicate samples will be collected at the rate of one duplicate for every 10 samples collected.

- A trip blank will accompany each sampling cooler with VOC samples and will be provided by the designated laboratory. The trip blank will be used to evaluate the presence of cross-contamination of the environmental samples. The trip blank will be analyzed for VOCs.
- Equipment rinsate blanks will be prepared by pouring laboratory-grade deionized water over nondisposable sampling equipment after it has been decontaminated and collecting the rinse water in sample containers for analyses. These samples will be prepared to demonstrate that the equipment decontamination procedures for the sampling equipment were performed effectively. The equipment rinsate blanks will be prepared each day that non-disposable sampling equipment is used.
- Temperature blanks will be prepared in the field and will consist of one 40-milliliter glass sample container with Teflon-lined septum cap. The temperature blank will be packaged along with the field samples in the shipping cooler and will represent the temperature of the incoming cooler upon receipt at the laboratory. Use of these samples within a shipping container enables the laboratory to assess the temperature of the shipment without disturbing any of the field samples.
- If necessary, field blanks will be collected when VOC samples are taken and are analyzed only for VOC analytes. The field blank consists of American Society of Testing and Materials (ASTM) Type II reagent-grade water poured into a VOC sample vial at the sampling site. It is handled like an environmental sample and transported to the laboratory for analysis. Field blanks are used to assess the potential introduction of contaminants from ambient sources (e.g., gasoline motors in operation, etc.) to the samples during sample collection. It is anticipated that no field blanks will be collected as part of this sampling activity.
- MS/MSD samples will be collected during sampling activities at locations selected by the START-3 PTL. The data obtained from these samples will be used to assist in the quality assurance of the sampling procedures and laboratory analytical data by allowing an evaluation of reproducibility of results. Efforts will be made to collect MS/MSD samples in locations where there is no visual evidence of contamination or where contamination is not suspected. MS/MSD samples will be collected at the rate of one MS/MSD sample per matrix for every 20 samples collected.

3.3 SAMPLE MANAGEMENT

Specific nomenclature that will be used by START-3 will provide a consistent means of facilitating the sampling and overall data management for the project (WESTON SOP 0110.05). The START-3 Assessment/Inspection Manager must approve any deviations from the sample nomenclature proposed below.

As stated in WESTON SOP 0110.05, sample nomenclature will follow a general format regardless of the type or location of the sample collected. The general nomenclature consists of the following components:

- Geographic location (e.g., location within a surface water body or monitoring well).
- Collection type (composite, grab, etc.).
- QA/QC type (normal, duplicate, etc.).
- Sequence and/or Depth - An additional parameter used to further differentiate samples.

Sample data management will be completed utilizing SCRIBE including Chain-of-Custody (COC) and sample documentation needs.

3.4 DECONTAMINATION

The nondisposable sampling equipment (hand trowels, stainless steel bowls, etc.) used during the sample collection process will be thoroughly decontaminated before initial use, between use, and at the end of the field investigation. Equipment decontamination will be completed in the following steps:

- Water spray or brush, if needed, to remove soil/sediment from the equipment.
- Nonphosphate detergent and potable water wash to clean the equipment.
- Final potable water rinse.
- Air-dried equipment.

Personnel decontamination procedures are described in the site-specific HASP. All decontamination activities will be conducted at a temporary decontamination pad that will be constructed in an area to be determined by the PTL prior to the beginning of field activities.

Excess soil and fluids generated as a result of equipment decontamination will be placed in a drum and staged in an area to be determined by the PTL. The drum will be labelled on the side with the name of the site, the contents, sampling location, and date.

3.5 SAMPLE PRESERVATION, CONTAINERS, AND HOLD TIMES

Once collected, samples will be stored in coolers and kept at approximately 4° C while at the site and until they are submitted for analysis. Chain-of-custody forms will be completed for each

sample shipment and sent with the samples to the designated laboratory by overnight carrier. Samples that have been analyzed will be disposed of by the designated laboratory in accordance with the laboratory SOPs.

Table 3-1
Site Assessment Sample Locations and Sampling Rationale
Delta Shipyard Site
Houma, Terrebonne Parish, Louisiana

Sample Name	Sample Matrix	Sample Location (refer to Figures 3-1& 3-2)	Rationale
BLC-01-00-111 BLC-01-03-611	Surface water Sediment	Bayou La Carpe mid-point between the Intracoastal Waterway and Houma Navigation Canal	Collected to establish background concentration in Bayou La Carpe
BLC-02-00-111 BLC-02-03-611	Surface water Sediment	Bayou La Carpe right before confluence with Houma Navigation Canal	Collected to establish background concentration in Bayou La Carpe
HNC-01-00-111 HNC-01-03-611	Surface water Sediment	Houma Navigation Canal mid-point between the Intracoastal Waterway and confluence with Bayou La Carpe	Collected to establish background concentration in Houma Navigation Canal
HNC-02-00-111 HNC-02-03-611	Surface water Sediment	Houma Navigation Canal right before confluence with Bayou La Carpe	Collected to establish background concentration in Houma Navigation Canal
CC-01-00-111 CC-01-03-611	Surface water Sediment	Company Canal upstream of the Site	Collected to establish background concentration in Company Canal
MPC-01-00-111 MPC-01-03-611	Surface water Sediment	Main Port Canal upstream of the convergence with Bayou La Carpe	Collected to establish background concentration in Main Port Canal
DC-01-00-111 DC-01-00-111	Surface water Sediment	Dickson Canal upstream of the convergence with Houma Navigation Canal	Collected to establish background concentration in Dickson Canal
CC-02-00-112 CC-02-03-612 CC-02-00-122 CC-02-03-622	Surface water Sediment	Within Company Canal at the Probable Point of Entry	To establish Observed Release into surface water pathway
CC-03-00-112 CC-03-03-612	Surface water Sediment	Within Company Canal	To establish Observed Release into surface water pathway
CC-04-00-112 CC-03-03-612	Surface water Sediment	Within Company Canal	To establish Observed Release into surface water pathway
BLC-03-00-112 BLC-03-03-612	Surface water Sediment	Within Bayou La Carpe	To establish Observed Release into surface water pathway
BLC-04-00-112 BLC-04-03-612	Surface water Sediment	Within Bayou La Carpe	To establish Observed Release into surface water pathway
HNC-03-00-112 HNC-03-03-612 HNC-03-00-122 HNC-03-03-622	Surface water Sediment	Within Houma Navigation Canal	To establish Observed Release into surface water pathway
HNC-04-00-112 HNC-04-03-612	Surface water Sediment	Within Houma Navigation Canal	To establish Observed Release into surface water pathway
HNC-05-00-112 HNC-05-03-612	Surface water Sediment	Within Houma Navigation Canal	To establish Observed Release into surface water pathway
DSE-01-12-413	Solid Waste	From Pit 1	Source Characterization – these will be the same samples as those collected for the removal assessment at 0-12 inches
DSE-02-12-413	Solid Waste	From Pit 2	Source Characterization – these will be the same samples as those collected for the removal assessment at 0-12 inches
DSE-03-12-413	Solid Waste	From Pit 3	Source Characterization – these will be the same samples as those collected for the removal assessment at 0-12 inches
DSW-01-01-513	Soil	From historical pit location	Potential source identification/characterization
DSW-02-01-513	Soil	From historical pit location	Potential source identification/characterization
DSE-05-01-514 DSE-05-01-524	Soil	north of Pit 1	To establish attribution through overland flow migration
DSE-07-01-514	Soil	West of Pit 1 within drainage ditch	To establish attribution through overland flow migration
DSE-10-01-514	Soil	West of Pit 2 within drainage ditch	To establish attribution through overland flow migration
DSE-13-01-514	Soil	West of Pit 3 within drainage ditch	To establish attribution through overland flow migration

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

Sample Name	Sample Matrix	Sample Location (refer to Figures 3-1& 3-2)	Rationale
DSE-16-01-514	Soil	South of Pit 3 within area of dams and weirs	To establish attribution through overland flow migration
DSE-17-01-514	Soil	South of Pit 3 within area of dams and weirs	To establish attribution through overland flow migration
DSE-18-01-514 DSE-18-01-524	Soil	Southeast of Pits before entry into Company Canal	To establish attribution through overland flow migration
DSE-09-01-514	Soil	East of Pit 1 along Company Canal	To establish attribution through overland flow migration
DSE-12-01-514	Soil	East Pit 2 along Company Canal	To establish attribution through overland flow migration
DSE-15-01-514	Soil	East Pit 3 along Company Canal	To establish attribution through overland flow migration

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

Table 3-2
Removal Assessment Sample Locations and Sampling Rationale
Delta Shipyard Site
Houma, Terrebonne Parish, Louisiana

Sample Name	Sample Matrix	Sample Location (refer to Figures 3-1& 3-2)	Rationale
DSE-01-12-413	Solid Waste	From Pit 1	Source Characterization (0 to 12 inches)
DSE-01-24-413	Solid Waste	From Pit 1	Source Characterization (1 to 2 feet)
DSE-01-48-413	Solid Waste	From Pit 1	Source Characterization (2 to 4 feet)
DSE-01-72-413	Solid Waste	From Pit 1	Source Characterization (4 to 6 feet)
DSE-01-96-413	Solid Waste	From Pit 1	Source Characterization (6 to 8 feet)
DSE-02-12-413	Solid Waste	From Pit 2	Source Characterization (0 to 12 inches)
DSE-02-24-413	Solid Waste	From Pit 2	Source Characterization (1 to 2 feet)
DSE-02-48-413	Solid Waste	From Pit 2	Source Characterization (2 to 4 feet)
DSE-02-72-413	Solid Waste	From Pit 2	Source Characterization (4 to 6 feet)
DSE-02-96-413	Solid Waste	From Pit 2	Source Characterization (6 to 8 feet)
DSE-03-12-413	Solid Waste	From Pit 3	Source Characterization (0 to 12 inches)
DSE-03-24-413	Solid Waste	From Pit 3	Source Characterization (1 to 2 feet)
DSE-03-48-413	Solid Waste	From Pit 3	Source Characterization (2 to 4 feet)
DSE-03-72-413	Solid Waste	From Pit 3	Source Characterization (4 to 6 feet)
DSE-03-96-413	Solid Waste	From Pit 3	Source Characterization (6 to 8 feet)
DSE-04-12-515	Soil	Northwest of Pit 1	Extent of Contamination (0 to 12 inches)
DSE-04-24-515	Soil	Northwest of Pit 1	Extent of Contamination (1 to 2 feet)
DSE-04-48-515	Soil	Northwest of Pit 1	Extent of Contamination (2 to 4 feet)
DSE-04-72-515	Soil	Northwest of Pit 1	Extent of Contamination (4 to 6 feet)
DSE-04-96-515	Soil	Northwest of Pit 1	Extent of Contamination (6 to 8 feet)
DSE-05-12-515	Soil	North of Pit 1	Extent of Contamination (0 to 12 inches)
DSE-05-24-515	Soil	North of Pit 1	Extent of Contamination (1 to 2 feet)
DSE-05-48-515	Soil	North of Pit 1	Extent of Contamination (2 to 4 feet)
DSE-05-72-515	Soil	North of Pit 1	Extent of Contamination (4 to 6 feet)
DSE-05-96-515	Soil	North of Pit 1	Extent of Contamination (6 to 8 feet)
DSE-06-12-515	Soil	Northeast of Pit 1	Extent of Contamination (0 to 12 inches)
DSE-06-24-515	Soil	Northeast of Pit 1	Extent of Contamination (1 to 2 feet)
DSE-06-48-515	Soil	Northeast of Pit 1	Extent of Contamination (2 to 4 feet)
DSE-06-72-515	Soil	Northeast of Pit 1	Extent of Contamination (4 to 6 feet)
DSE-06-96-515	Soil	Northeast of Pit 1	Extent of Contamination (6 to 8 feet)
DSE-07-12-515	Soil	West of Pit 1	Extent of Contamination (0 to 12 inches)
DSE-07-24-515	Soil	West of Pit 1	Extent of Contamination (1 to 2 feet)
DSE-07-48-515	Soil	West of Pit 1	Extent of Contamination (2 to 4 feet)
DSE-07-72-515	Soil	West of Pit 1	Extent of Contamination (4 to 6 feet)
DSE-07-96-515	Soil	West of Pit 1	Extent of Contamination (6 to 8 feet)
DSE-08-12-515	Soil	East of Pit 1	Extent of Contamination (0 to 12 inches)
DSE-08-24-515	Soil	East of Pit 1	Extent of Contamination (1 to 2 feet)
DSE-08-48-515	Soil	East of Pit 1	Extent of Contamination (2 to 4 feet)
DSE-08-72-515	Soil	East of Pit 1	Extent of Contamination (4 to 6 feet)
DSE-08-96-515	Soil	East of Pit 1	Extent of Contamination (6 to 8 feet)
DSE-10-12-515	Soil	West of Pit 2	Extent of Contamination (0 to 12 inches)
DSE-10-24-515	Soil	West of Pit 2	Extent of Contamination (1 to 2 feet)
DSE-10-48-515	Soil	West of Pit 2	Extent of Contamination (2 to 4 feet)
DSE-10-72-515	Soil	West of Pit 2	Extent of Contamination (4 to 6 feet)
DSE-10-96-515	Soil	West of Pit 2	Extent of Contamination (6 to 8 feet)
DSE-11-12-515	Soil	East of Pit 2	Extent of Contamination (0 to 12 inches)
DSE-11-24-515	Soil	East of Pit 2	Extent of Contamination (1 to 2 feet)
DSE-11-48-515	Soil	East of Pit 2	Extent of Contamination (2 to 4 feet)

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

Sample Name	Sample Matrix	Sample Location (refer to Figures 3-1& 3-2)	Rationale
DSE-11-72-515	Soil	East of Pit 2	Extent of Contamination (4 to 6 feet)
DSE-11-96-515	Soil	East of Pit 2	Extent of Contamination (6 to 8 feet)
DSE-13-12-515	Soil	West of Pit 3	Extent of Contamination (0 to 12 inches)
DSE-13-24-515	Soil	West of Pit 3	Extent of Contamination (1 to 2 feet)
DSE-13-48-515	Soil	West of Pit 3	Extent of Contamination (2 to 4 feet)
DSE-13-72-515	Soil	West of Pit 3	Extent of Contamination (4 to 6 feet)
DSE-13-96-515	Soil	West of Pit 3	Extent of Contamination (6 to 8 feet)
DSE-14-12-515	Soil	East of Pit 3	Extent of Contamination (0 to 12 inches)
DSE-14-24-515	Soil	East of Pit 3	Extent of Contamination (1 to 2 feet)
DSE-14-48-515	Soil	East of Pit 3	Extent of Contamination (2 to 4 feet)
DSE-14-72-515	Soil	East of Pit 3	Extent of Contamination (4 to 6 feet)
DSE-14-96-515	Soil	East of Pit 3	Extent of Contamination (6 to 8 feet)
DSE-16-12-515	Soil	Southwest of Pit 3	Extent of Contamination (0 to 12 inches)
DSE-16-24-515	Soil	Southwest of Pit 3	Extent of Contamination (1 to 2 feet)
DSE-16-48-515	Soil	Southwest of Pit 3	Extent of Contamination (2 to 4 feet)
DSE-16-72-515	Soil	Southwest of Pit 3	Extent of Contamination (4 to 6 feet)
DSE-16-96-515	Soil	Southwest of Pit 3	Extent of Contamination (6 to 8 feet)
DSE-17-12-515	Soil	South of Pit 3	Extent of Contamination (0 to 12 inches)
DSE-17-24-515	Soil	South of Pit 3	Extent of Contamination (1 to 2 feet)
DSE-17-48-515	Soil	South of Pit 3	Extent of Contamination (2 to 4 feet)
DSE-17-72-515	Soil	South of Pit 3	Extent of Contamination (4 to 6 feet)
DSE-17-96-515	Soil	South of Pit 3	Extent of Contamination (6 to 8 feet)
DSE-18-12-515	Soil	Southwest of Pit 3	Extent of Contamination (0 to 12 inches)
DSE-18-24-515	Soil	Southwest of Pit 3	Extent of Contamination (1 to 2 feet)
DSE-18-48-515	Soil	Southwest of Pit 3	Extent of Contamination (2 to 4 feet)
DSE-18-72-515	Soil	Southwest of Pit 3	Extent of Contamination (4 to 6 feet)
DSE-18-96-515	Soil	Southwest of Pit 3	Extent of Contamination (6 to 8 feet)

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

4. ANALYTICAL METHODS

Waste Samples

START-3 will submit the waste samples to a NELAP certified laboratory, for the following analyses:

- Total Compound List (TCL) Volatiles Organic Compounds (VOC) by SW846 Method 8260B;
- TCL Semivolatile Organic Compounds (SVOCs) by SW386 Method 8270C;
- Organochlorine Pesticides (Pesticides) by SW846 Method 8081B;
- Polychlorinated Biphenyls (PCBs) by SW846 Method 8082A;
- Chlorinated Herbicides (Herbicides) by SW846 Method 8151A;
- Total Analyte List (TAL) metals including mercury by SW846 Methods 6010B and 7470/7471, respectively.
- Toxicity Characteristic Leachate Procedure (TCLP) Total Volatiles Organic Compounds (VOC) by SW846 Method 1311/8260B;
- TCLP Semivolatile Organic Compounds (SVOCs) by SW386 Method 1311/8270C;
- TCLP Metals including mercury by SW846 Methods 1311/6010B and 1311/7470/7471, respectively.

Soil, Sediment and Surface Water Samples

Soil, sediment and surface water samples will be submitted to a NELAP certified laboratory for the following analyses:

- TCL VOCs by SW846 Method 8260B;
- TCL SVOCs by SW386 Method 8270C;
- Pesticides by SW846 Method 8081B;
- PCBs by SW846 Method 8082A;
- Herbicides by SW846 Method 8151A;
- TAL metals including mercury by SW846 Methods 6010B and 7470/7471, respectively.

Laboratory-specific analyte lists and reporting limits are included in Appendix D. Tables 4-1 and 4-2 summarize the samples that will be collected, including the volumes, container types, and associated analytical methods.

Table 4-1
Requirements for Containers, Preservation Techniques,
Sample Volumes, and Holding Times
Delta Shipyard
Houma, Terrebonne Parish, Louisiana

Name	Analytical Methods	Matrix	Container	Preservation	Minimum Volume or Weight	Maximum Holding Time
TCL VOCs (Including TCLP?)	SW846 8260B	Water / Solid	Glass, (Teflon-lined septum for water)	4°C, HCl to pH<2 (pH adjust for water only)	3 x 40 mL vials (water), 8 oz (solid)	14 days (7 days if unpreserved by acid for water)
TCL SVOCs (Including TCLP?)	SW846 8270C	Water / Solid	Amber Glass, (Teflon-lined for water)	4°C	2 x 1 liter (water), 8 oz (solid)	7 days extract (water), 14 days (solid)/ 40 days analysis
TAL Metals and Mercury (Including TCLP?)	SW846 6010B and SW846 7470/7471A	Water / Solid	Polyethylene (water), Glass (solid)	HNO ₃ to pH<2 (water), 4°C	500 mL, 8oz (solid-combined w/SVOCs)	28 days for mercury 180 days all other metals
Pesticides	SW846 8081B	Water / Solid	Amber Glass, (Teflon-lined for water)	4°C	2 x 1 liter (water), 8 oz (solid)	7 days extract (water), 14 days (solid)/ 40 days analysis
PCBs	SW846 8082A	Water / Solid	Amber Glass, (Teflon-lined for water)	4°C	1 x 1 liter (water), 8 oz (solid-combined w/SVOCs)	7 days extract (water), 14 days (solid)/ 40 days analysis
Herbicides	SW846 8151A	Water / Solid	Amber Glass, (Teflon-lined for water)	4°C	1 x 1 liter (water), 8 oz (solid-combined w/SVOCs)	7 days extract (water), 14 days (solid)/ 40 days analysis

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

Table 4-2
Field and Laboratory QA/QC and Analysis Summary
Delta Shipyard
Houma, Terrebonne Parish, Louisiana

Sample Type	Sample Collection Method	No. of Samples	Rationale	EPA Analytical Method
Surface Water	SOP 2013/1002.1	8	Extent of contamination within Company Canal, Bayou La Carpe, and Houma Navigation Canal	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7470
Surface Water	SOP 2013/1002.1	7	Background samples from Company Canal, Bayou La Carpe, Intracoastal Waterway, and Houma Navigation Canal	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7470
Duplicate Surface Water (10%)	SOP 1005.01	2	QA/QC	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7470
Sediment	SOP 2016/1002.4	8	Extent of contamination within Company Canal and Houma Navigation Canal	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7471
Sediment	SOP 2016/1002.4	7	Background samples from Company Canal, Bayou La Carpe, Intracoastal Waterway, and Houma Navigation Canal	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7471
Duplicate Soil/Sediment (10%)	SOP 1005.01	2	QA/QC	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7471
Solid Waste	SOP 2017/1003.02	3	Pits	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7471
Solid Waste (Removal Assessment)	SOP 2017/1003.02	15	Pits	SW846 1311/8260B, SW846 13/118270C SW846 8081B, SW846 8082A SW846 8151A, SW846 1311/6010B SW-846 1311/7471
Soil	SOP 2012/1001.01	2	Historical buried pits	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7471
Soil (Removal Assessment)	SOP 2012/1001.01	Up to 60	Extent of Contamination	SW846 1311/8260B, SW846 13/118270C SW846 8081B, SW846 8082A SW846 8151A, SW846 1311/6010B SW-846 1311/7471
Soil/Sediment	SOP 2012/1001.01	10	Overland flow – attribution samples	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7471
Trip Blanks	SOP 1005.04	5	QA/QC	SW846 8260B
Rinsate Blanks ¹	SOP 1005.02	5	QA/QC	SW846 8260B, SW846 8270C SW846 8081B, SW846 8082A SW846 8151A, SW846 6010B SW-846 7470

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

Table 4-2 (continued)
Requirements for Containers, Preservation Techniques,
Sample Volumes, and Holding Times
Delta Shipyard
Houma, Terrebonne Parish, Louisiana

Sample Type	Sample Collection Method	No. of Samples	Rationale	EPA Analytical Method
Temperature Blanks ²	N/A	5	QA/QC	Vial temperature measured upon arrival at laboratory

Note:

³Trip blanks will be submitted at a rate of one per cooler per shipment containing samples for VOC analysis.

²Rinsate blanks: samples will be collected at the rate of one per day per non-disposable sampling equipment.

³Temperature blanks: samples will be submitted at a rate of one per cooler.

5. DATA VALIDATION

The analytical data generated by the designated laboratory will be validated using EPA-approved data validation procedures in accordance with the EPA *CLP National Functional Guidelines* for Inorganic Superfund Data Review (January 2010) and Superfund Organic Methods Data Review (June 2008). A summary of the data validation findings will be presented in Data Validation Summary Reports as part of the final report. The following will be evaluated to verify that the analytical data is within acceptable QA/QC tolerances:

- The completeness of the Laboratory Reports, verifying that all required components of the report are present and that the samples indicated on the accompanying chain-of-custody are addressed in the report.
- The calibration and tuning records for the laboratory instruments used for the sample analyses.
- The results of internal standards analyses.
- The results of laboratory blank analyses.
- The results of LCS analyses.
- The results of MS/MSD analyses.
- Compound identification and quantification accuracy.
- Laboratory precision, by reviewing the results for blind field duplicates.

Variances from the QA/QC objectives will be addressed as part of the Data Validation Summary Reports.

6. QUALITY ASSURANCE

Quality assurance will be conducted in accordance with the WESTON Corporate Quality Management Manual, dated June 2012; the WESTON START-3 Quality Management Plan, dated July 2009; and EPA Quality Assurance/Quality Control Guidance for Removal Activities, dated April 1990. Following receipt of the TDD from EPA, a Quality Control (QC) officer is assigned and monitors work conducted throughout the entire project including reviewing interim report deliverables and field audits. The START-3 PTL will be responsible for QA/QC of the field investigation activities. The designated laboratory utilized during the investigation will be responsible for QA/QC related to the analytical work. START-3 will also collect samples to verify that laboratory QA/QC is consistent with the required standards and to validate the laboratory data received.

6.1 SAMPLE CUSTODY PROCEDURES

Because of the evidentiary nature of sample collection, the possession of samples must be traceable from the time the samples are collected until they are introduced as evidence in legal proceedings. After sample collection and identification, samples will be maintained under chain-of-custody (COC) procedures. If the sample collected is to be split (laboratory QC), the sample will be allocated into similar sample containers. Sample labels completed with the same information as that on the original sample container will be attached to each of the split samples. All personnel required to package and ship coolers containing potentially hazardous material will be trained accordingly.

START-3 personnel will prepare and complete chain-of-custody forms using the Scribe Environmental Sampling Data Management System (SCRIBE) for all samples sent to a START-3 designated off-site laboratory. The chain-of-custody procedures are documented and will be made available to all personnel involved with the sampling. A typical chain-of-custody record will be completed each time a sample or group of samples is prepared for shipment to the laboratory. The record will repeat the information on each sample label and will serve as documentation of handling during shipment. A copy of this record will remain with the shipped samples at all times, and another copy will be retained by the member of the sampling team who

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

originally relinquished the samples. At the completion of the project, the data manager will export the SCRIBE chain-of-custody documentation to the Analytical Service Tracking System (ANSETS) database.

Samples relinquished to the participating laboratories will be subject to the following procedures for transfer of custody and shipment:

- Samples will be accompanied by the COC record. When transferring possession of samples, the individuals relinquishing and receiving the samples will sign, date, and note the time of the sample transfer on the record. This custody records document transfer of sample custody from the sampler to another person or to the laboratory.
- Samples will be properly packed for shipment and dispatched to the appropriate laboratory for analysis with separate, signed custody records enclosed in each sample box or cooler. Sample shipping containers will be custody-sealed for shipment to the laboratory. The preferred procedure includes use of a custody seal wrapped across filament tape that is wrapped around the package at least twice. The custody seal will then be folded over and stuck to seal to ensure that the only access to the package is by cutting the filament tape or breaking the seal to unwrap the tape.
- If sent by common carrier, a bill of lading or airbill will be used. Bill of lading and airbill receipts will be retained in the project file as part of the permanent documentation of sample shipping and transfer.

SOPs 1101.01 and 1102.01 describe these procedures in more detail.

6.2 PROJECT DOCUMENTATION

All documents will be completed legibly in ink and by entry into field logbooks and SCRIBE. Response Manager will be used after direction of the EPA SAM.

6.2.1 Field Documentation

The following field documentation will be maintained as described below.

Field Logbook

The field logbook is a descriptive notebook detailing site activities and observations so that an accurate, factual account of field procedures may be reconstructed. All entries will be signed by the individuals making them. Entries should include, at a minimum, the following:

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

- Site name and project number.
- Names of personnel on-site.
- Dates and times of all entries.
- Description of all site activities, including site entry and exit times.
- Noteworthy events and discussions.
- Weather conditions.
- Site observations.
- Identification and description of samples and locations.
- Subcontractor information and names of on-site personnel.
- Dates and times of sample collections and chain-of-custody information.
- Records of photographs.
- Site sketches.
- Calibration results.

Sample Labels

Sample labels will be securely affixed to the sample container. The labels will clearly identify the particular sample and include the following information:

- Site name and project number.
- Date and time the sample was collected.
- Sample preservation method.
- Analysis requested.
- Sampling location.

Chain-of-Custody Record

A chain-of-custody will be maintained from the time of sample collection until final deposition. Every transfer of custody will be noted and signed for, and a copy of the record will be kept by each individual who has signed it.

Custody Seal

Custody seals demonstrate that a sample container has not been tampered with or opened. The individual who has custody of the samples will sign and date the seal and affix it to the container in such a manner that it cannot be opened without breaking the seal.

Photographic Documentation

START-3 will take photographs to document site conditions and activities as site work progresses. Initial conditions should be well documented by photographing features that define

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

the site-related contamination or special working conditions. Representative photographs should be taken of each type of site activity. The photographs should show typical operations and operating conditions as well as special situations and conditions that may arise during site activities. Site final conditions should also be documented as a record of how the site appeared at completion of the work.

All photographs should be taken with either a film camera or digital camera capable of recording the date on the image. Each photograph will be recorded in the logbook with the location of the photographer, direction the photograph was taken, the subject of the photograph, and its significance (i.e., why the picture was taken). Where appropriate, the photograph location, direction, and subject will also be shown on a site sketch and recorded within Response Manager.

Response Manager

Response Manager is the Enterprise Data Collection System designed to provide near real-time access to non-analytical data normally collected in logbooks. Response Manager provides a standard data collection interface for modules of data normally collected by START-3 field personnel while on-site. These modules fall into two basic categories for Response and Removal. The modules include Emergency Response, Reconnaissance, Facility Assessment, Shipping, Containers, Materials, Calls, HHW, and General/Site Specific data. The system provides users with a standard template for laptop/desktop/tablet PCs that will synchronize to the secure web interface using merge replication technology to provide access to field collected data via on the RRC-EDMS EPA Web Hub. Response Manager also includes a PDA application that provides some of the standard data entry templates from Response Manager to users for field data entry. Response Manager also includes an integrated GPS unit with the secure PDA application, and the coordinates collected in Response Manager are automatically mapped on the RRC-EDMS interactive mapping site. GIS personnel can then access this data to provide comprehensive site maps for decision-making support.

Response Manager also includes an Analytical Module that is designed to give SCRIBE users the ability to synchronize the SCRIBE field data to the RRC-EDMS Web Hub. This allows analytical data managers and data validators access to data to perform reviews from anywhere

THIS DOCUMENT WAS PREPARED BY WESTON SOLUTIONS, INC., EXPRESSLY FOR EPA. IT SHALL NOT BE RELEASED OR DISCLOSED IN WHOLE OR IN PART WITHOUT THE EXPRESS, WRITTEN PERMISSION OF EPA.

with an Internet connection. The Analytical Module is designed to take the analytical data entered into EPA SCRIBE software and make it available for multiple users to access on one site. START-3 personnel will utilize SCRIBE for all data entry on-site and will upload to the Response Manager Analytical Module.

START-3 will use the Response Manager module located on the EPA Web Hub, <https://solutions.westonproject.net/epawebhub/>, to compile and organize the data collected from project activities. The information to be included encompasses some or all of the following depending on the specific project needs:

- General Module – site-specific data including location and type of site. It also includes an area for key site locations including geo-spatial data associated with the key site locations.
- Emergency Response Module – includes the following sub-modules: Basic Info, HAZMAT, Release, Time Line Log, Incident Zones, Photos, Sensitive Receptors, Evacuations, Source, Cause, and Weather.
- Reconnaissance Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for targeted reconnaissance efforts. Typically the data in this module is associated with ESF-10 deployments and the clean-up of orphaned containers and hazardous debris, but the module can be utilized for any or all reconnaissance activities.
- Facility Assessment Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for assessments of structures. Typically utilized for EPA-regulated program facilities during an ESF-10 deployment of resources. This module can be utilized to track the assessment of any facilities including multiple assessments of the fixed facilities.
- Shipping Module – provides standard templates for creating a cradle-to-grave record of all waste shipments from the site until they are recycled or destroyed. This includes the ability to capture manifests and manifest line items and upload photos/original documents to support the records.
- Container Module – provides standard templates for cataloguing containers including HAZCAT and Layer information in each container. The module also allows for tracking which containers are bulked.
- Properties Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for collection of property data including access agreements and assessments of the property and current status of property regarding the site removal action.

- Materials Module – provides standard templates for tracking materials that are brought on-site or that are removed from the site.
- Daily Reports – provides standard templates for tracking daily site activities, daily site personnel, and daily site notes for reporting back to the EPA OSC in a POLREP or SITREP.
- HHW Module – provides standard templates with the flexibility of adding any additional questions of values to the drop-down lists for tracking the amount of HHW collected at individual collection stations by HHW type.
- Data Files – data files can be uploaded in the photo module section and be associated with individual records or with the site in general. The meta-data associated with that data file can be filled in using the photo log fields.

The data stored in the Response Manager database can be viewed and edited by any individual with access rights to those functions. At any time deemed necessary, POLREPs and/or SITREPs can be generated by exporting the data out of Response Manager into Microsoft Excel/Word. The database is stored on a secure server and backed up regularly.

6.2.2 Report Preparation

At the completion of the project, START-3 will review and validate all laboratory data and prepare a draft report of field activities and analytical results for EPA SAM review. Draft deliverable documents will be uploaded to the EPA TeamLink website for EPA SAM review and comment.